

IN THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

Claims 1-31 are cancelled. Claims 32-60 are now pending in this application.

1-31 (Cancelled)

32. (New) An assembly comprising:

- a load member; and
- a brushless DC motor, comprising:
 - a rotor;
 - a stator housing at least one stator coil; and
 - a drive circuit comprising:
 - a rotor position measurement circuit for measuring angular position of the rotor relative to the stator and for determining motor speed;
 - a commutator circuit for connecting and interrupting current to the stator coil at specified moments of commutation determined from the angular rotor position relative to the stator; and
 - a commutation shifting apparatus for shifting the specified moments of commutation, the amount of shifting being a predetermined function of motor speed.

33. (New) The assembly of claim 32, wherein the commutation shifting apparatus, responsive to initial start-up, pre-displaces the moments of commutation by a specified, first electrical preignition angle with respect to the rotational position of the rotor.

34. (New) The assembly of claim 32, wherein the commutation shifting apparatus pre-displaces the moments of commutation increasingly toward the rotational position of the rotor after a specified motor speed has been exceeded.

35. (New) The assembly of claim 32, wherein the commutation shifting apparatus shifts the moment for turn-on of a motor current that is allocated to one commutation phase.

36. (New) The assembly of claim 32, wherein the commutation shifting apparatus shifts the moment for turn-off of a motor current that is allocated to one commutation phase.

37. (New) The assembly of claim 32, wherein the drive circuit further comprises a microprocessor controller.

38. (New) The assembly of claim 32, wherein the drive circuit further comprises a speed control circuit.

39. (New) The assembly of claim 32, wherein the rotor position measuring circuit comprises a circuit for measuring motor speed and wherein the amount of commutation moment shifting by the commutation shifting apparatus is a predetermined function of measured motor speed.

40. (New) The assembly of claim 39, wherein the commutation shifting apparatus pre-displaces the moments of commutation relative to the rotational position of the rotor, as a function of the estimated motor speed.

41. (New) The assembly of claim 32, wherein the rotor position measuring circuit comprises a circuit for estimating motor speed and the amount of commutation

moment shifting by the commutation shifting apparatus is a predetermined function of estimated motor speed.

42. (New) An assembly, comprising:

a load member; and

a brushless DC motor, comprising:

a rotor;

a stator housing at least one stator coil; and

a drive circuit comprising:

a rotor position measuring circuit for measuring angular position of the rotor relative to the stator and for determining motor speed;

a commutator circuit for connecting and interrupting current to the stator coil at specified moments of commutation determined from the angular rotor position relative to the stator; and

a commutation shifting apparatus for shifting the specified moments of commutation, the amount of shifting being a predetermined function of motor speed, wherein the moments of commutation are shifted as a function of the motor speed according to an unsteady function.

43. (New) The assembly of claim 42, wherein the commutation shifting apparatus, responsive to initial start-up, pre-displaces the moments of commutation by a specified, first electrical preignition angle with respect to the rotational position of the rotor.

44. (New) The assembly of claim 42, wherein the commutation shifting apparatus pre-displaces the moments of commutation increasingly toward the rotational position of the rotor after a specified motor speed has been exceeded.

45. (New) The assembly of claim 42, wherein the commutation shifting

apparatus shifts the moment for turn-on of a motor current that is allocated to one commutation phase.

46. (New) The assembly of claim 42, wherein the commutation shifting apparatus shifts the moment for turn-off of a motor current that is allocated to one commutation phase.

47. (New) The assembly of claim 42, wherein the drive circuit further comprises a microprocessor controller.

48. (New) The assembly of claim 42, wherein the drive circuit further comprises a speed control circuit.

49. (New) The assembly of claim 42, wherein the first apparatus comprises a circuit for measuring motor speed and wherein the amount of commutation moment shifting by the commutation shifting apparatus is a predetermined function of measured motor speed.

50. (New) The assembly of claim 49, wherein the commutation shifting apparatus pre-displaces the moments of commutation relative to the rotational position of the rotor, as a function of the estimated motor speed.

51. (New) The assembly of claim 42, wherein the rotor position measuring circuit comprises a circuit for estimating motor speed and the amount of commutation moment shifting by the commutation shifting apparatus is a predetermined function of estimated motor speed.

52. (New) An assembly comprising:

a load member; and

a brushless DC motor, comprising:

a rotor;

a stator housing at least one stator coil; and

a drive circuit comprising:

a rotor position measuring circuit for measuring angular position of the rotor relative to the stator and for determining motor speed;

a commutator circuit for connecting and interrupting current to the stator coil at specified moments of commutation determined from the angular rotor position relative to the stator; and

a commutation shifting apparatus for shifting the specified moments of commutation, the amount of shifting being a predetermined function of motor speed, wherein the moments of commutation are shifted as a function of the motor speed according to a piece-wise linear function.

53. (New) The assembly of claim 52, wherein the commutation shifting apparatus, responsive to initial start-up, pre-displaces the moments of commutation by a specified, first electrical preignition angle with respect to the rotational position of the rotor.

54. (New) The assembly of claim 52, wherein the commutation shifting apparatus pre-displaces the moments of commutation increasingly toward the rotational position of the rotor after a specified motor speed has been exceeded.

55. (New) The assembly of claim 52, wherein the commutation shifting apparatus shifts the moment for turn-on of a motor current that is allocated to one commutation phase.

56. (New) The assembly of claim 52, wherein the commutation shifting apparatus shifts the moment for turn-off of a motor current that is allocated to one commutation phase.

57. (New) The assembly of claim 52, wherein the drive circuit further comprises a microprocessor controller.

58. (New) The assembly of claim 52, wherein the drive circuit further comprises a speed control circuit.

59. (New) The assembly of claim 52, wherein the first apparatus comprises a circuit for measuring motor speed and wherein the amount of commutation moment shifting by the commutation shifting apparatus is a predetermined function of measured motor speed.

60. (New) The assembly of claim 59, wherein the commutation shifting apparatus pre-displaces the moments of commutation relative to the rotational position of the rotor, as a function of the estimated motor speed.

61. (New) The assembly of claim 52, wherein the rotor position measuring circuit comprises a circuit for estimating motor speed and the amount of commutation moment shifting by the commutation shifting apparatus is a predetermined function of estimated motor speed.